Amendments to the Claims

1. (Currently amended) A method for down-converting a frequency modulated (FM) signal, comprising the steps of:

(1) aliasing the FM signal at an aliasing rate, said aliasing rate being determined by the frequency of the FM signal;

(2) adjusting said aliasing rate to compensate for frequency changes of the FM signal; and

(3) outputting, responsive to steps (1) and (2), a demodulated baseband information signal.

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2. (Original) The method of claim 1, wherein step (1) comprises:

aliasing the FM signal at an aliasing rate that is substantially equal to a sub-harmonic of a frequency of the FM signal.

3. (Original) The method of claim 1, wherein step (1) comprises:

aliasing the FM signal at an aliasing rate that is substantially equal to a frequency of the FM signal.

4. (Original) The method of claim 1, further comprising the step of:

compensating for phase delays to maintain bandwidth and stability.

5. (Original) The method of claim 1, wherein the FM signal has a frequency substantially equal to a Family Radio Service frequency.

6. (Currently amended) A method for directly down-converting a frequency modulated (FM) signal having a carrier frequency, comprising the steps of:

(1) aliasing the FM signal with a first local oscillator (LO) signal to create a first down-converted signal, said first LO signal having a first LO frequency and a first LO phase;

(2) aliasing the FM signal with a second LO signal to create a second down-converted signal, said second LO signal having a second LO frequency and a second LO phase, wherein said second LO frequency is substantially the same as said first LO frequency, and wherein said second LO phase is shifted relative to said first LO phase;

(3) combining said first down-converted signal and said second down-converted signal to create a summation signal;

(4) integrating said summation signal to create a control signal;

(5) creating an aliasing signal from said control signal; and

(6) outputting, responsive to steps (1)-(5), a demodulated baseband information signal.

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7. (Original) The method of claim 6, wherein said second LO phase is shifted relative to said first LO phase by an amount that is substantially equal to one-quarter period of the FM signal.

8. (Original) The method of claim 6, wherein said second LO phase is shifted relative to said first LO phase by an amount that is substantially equal to any multiple of a period of the FM signal plus one-quarter period of the FM signal.

9. (Original) The method of claim 6, wherein step (5) comprises:

(a) compensating for phase delays to maintain stability by adjusting said control signal to create a compensated control signal; and

(b) creating said aliasing signal using said compensated control signal.

10. (Original) The method of claim 6, wherein said aliasing signal is substantially equal to a sub-harmonic of the carrier frequency of the FM signal.

11. (Original) The method of claim 6, wherein said aliasing signal is substantially equal to the carrier frequency of the FM signal.

12. (Original) A system for down-converting a frequency modulated (FM) signal having a carrier frequency, comprising:

a first aliasing module to alias the FM signal with a first local oscillating (LO) signal, said first LO signal having a first LO signal frequency and a first LO signal phase, said first LO signal frequency being a function of an aliasing rate, and said first aliasing module outputting a first down-converted signal;

a second aliasing module to alias the FM signal with a second LO signal, said second LO signal having a second LO signal frequency and a second LO signal phase, wherein said second LO signal frequency is substantially equal to said first LO signal frequency and said second LO signal phase is shifted relative to said first LO signal phase, said second aliasing module outputting a second down-converted signal;

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a summing module to combine said first down-converted signal and said second down-converted signal to create a summation signal;

an integration module to integrate said summation signal and create a control signal;

a voltage controlled oscillator to accept said control signal and to output an aliasing signal, wherein said aliasing signal determines said aliasing rate; and

wherein said control signal is a demodulated baseband information signal.

13. (Original) The system of claim 12, wherein said aliasing rate is determined by the carrier frequency of the FM signal.

14. (Original) The system of claim 13, wherein said aliasing rate is substantially equal to a sub-harmonic of the carrier frequency of the FM signal.

15. (Original) The system of claim 13, wherein said aliasing rate is substantially equal to the carrier frequency of the FM signal.

16. (Original) The system of claim 12, further comprising a compensation module that accepts said control signal and that outputs a compensated control signal, and wherein said voltage controlled oscillator accepts said compensated control signal.

17. (Original) The system of claim 16, wherein said compensation module compensates for phase delays to maintain bandwidth and stability.

18 (Original) The system of claim 12, wherein the carrier frequency of the FM signal is at a frequency substantially equal to a Family Radio Service frequency.

19. (Original) A method for down-converting a frequency modulated (FM) signal, comprising the steps of:

(1) aliasing the FM signal with a first local oscillator (LO) signal to create a first down-converted signal;

(2) aliasing the FM signal with a second LO signal to create a second down-converted signal;

(3) generating a control signal from said first and second down-converted signals, wherein said first and second LO signals are generated from said control signal; and

(4) adjusting said control signal based on frequency changes of the FM signal.

20. (Currently amended) The method of claim 19, wherein step (3) comprises the step of:

(a) summing said first and second down-converted signals to generate a summation signal [,] ; and

(b) integrating said summation signal to generate said control signal wherein said first and second LO signals are generated from said control signal.

21. (Original) The method of claim 20, wherein step (4) comprises the step of:

adjusting said control signal to maintain said summation signal at a value substantially equal to zero.

22. (Original) The method of claim 19, further comprising the step of:

maintaining said first and second LO signals such that one of said first and second LO signals leads the FM signal, and another of said first and second LO signals lags the FM signal.

23. (Original) A down-converter, comprising:

a first aliasing module;

a second aliasing module; and

a summer coupled to said first and second aliasing modules.

24. (Original) The down-converter of claim 23, further comprising:

an integrator coupled to said summer;

a voltage controlled oscillator (VCO) coupled to said integrator; and

a phase shifter coupled to said VCO.

25. (Original) The down-converter of claim 24, further comprising:

a loop compensation module coupled to said integrator and said voltage controlled oscillator.

26. (Original) A down-converter to down-convert a frequency modulated (FM) signal, comprising:

a first aliasing module to receive the FM signal and a first local oscillator (LO) signal, wherein said first aliasing module creates a first down-converted signal;

a second aliasing module to receive the FM signal and a second LO signal, wherein said second aliasing module creates a second down-converted signal;

a tracking module to track changes in frequency of the FM signal; and

an LO signal changing module to change said first and second LO signals based on said changes in frequency.

27. (Original) The down-converter of claim 26, wherein said tracking module comprises:

a summer that sums said first and second down-converted signals to generate a summation signal; and

an integrator that integrates said summation signal to generate a control signal.

28. (Currently amended) The down-converter of claim 27, wherein said LO signal changing module comprises:

a voltage controlled oscillator that modifies said first and second LO signals based on said control signal.